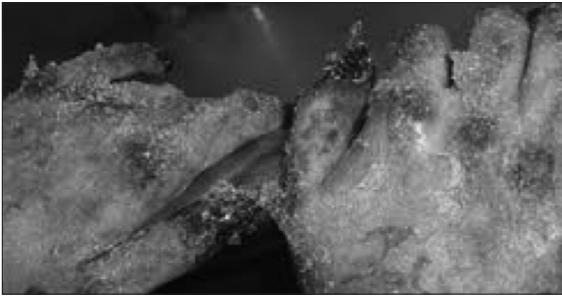


Picture This

How Would You Treat Hands Like These?



Frostbite is the freezing of the extremities (fingers, toes, nose, earlobes, etc.) caused by loss of blood flow, which can cause tissue damage and the need for amputation.

You're at risk of frostbite if you work outdoors, in/near/above water or inside freezers or refrigerated facilities, including:

- Construction and mining
- Utilities
- Oil and gas extraction
- Transportation and truck driving
- Agriculture, Lumber, Fishing
- Mortuaries
- Food production and warehousing

Make sure you know the signs and symptoms of frostbite so you can recognize and properly treat the condition.

Frostbite Signs & Symptoms

- Bluish/ pale, waxy skin
- Blackened skin (extreme cases)
- Blistering
- Numbness, tingling, stinging sensation

Frostbite First Aid Treatment

- Get into warm room ASAP
- Loosely cover affected area
- Give victim warm, sweetened (non-alcoholic) drinks
- Allow victim and affected area to warm up
- DO NOT rub affected area
- DO NOT directly expose affected area to fire, heat lamp or other heat source that can cause burns
- DO NOT break blisters

Frostbite Prevention

- Wear warm, insulated and water-proof gloves.
- Take frequent rest breaks to warm up.
- Keep your fingers and hands dry.
- Avoid touching cold metal objects with bare skin.

Fatality File

Carbon Monoxide Kills Two Workers Stranded in the Snow

Two men died from carbon monoxide poisoning after being stranded in the snow while driving home from work. As a dangerous winter storm swept across Montreal, Pierre Thibault and Michaël Fiset, chose to try and drive home from work despite their co-workers pleading with them to wait the storm out with them at the office.

Fiset, 33, was confident he could navigate the difficult conditions, despite heavy snow and high winds. When they left the office around 9:24 p.m., Fiset planned to drop his friend off at his home, about 8 miles/13 kilometers away, before heading to his own home.

Just a few hours earlier, the highways along their planned route had been closed because of whiteout conditions on the roads. However, Fiset decided to drive around the road closure barrier and continued his journey. At 10:43 p.m., he became stuck in a 5-foot/1.5-meter-high snowdrift. Both men contacted locals they knew seeking help, but no one could venture out because there was zero visibility and they couldn't see across the street. Thibault, 42, then made calls to the provincial police (SQ) and 911 at 11:18 p.m., saying they were stuck in the snow and needed assistance.

While police were trying to mobilize the rescue team, conditions in the truck were deteriorating. Fiset made a second call to 911 at 12:05 a.m. and a third call at 12:51 a.m.,

saying Thibault was having an asthma attack and was having trouble breathing. At 12:58 a.m., police informed the men a rescue team would be leaving shortly. By 1:16 a.m., Fiset called police to say he was also having trouble breathing and that Thibault was now unconscious. It was the last call Fiset would make.

The SQ snowmobile team was finally able to leave at 1:20 a.m. as the storm continued to intensify with howling winds and whiteout conditions. About 30 minutes into the trip they also became stuck in a snowdrift. They continued on foot and arrived on the scene at 2:15 a.m. but could not find Fiset's truck - by this time it was buried in the snow. They eventually found the truck at 7:50 a.m. buried in 9 feet/3 meters of snow.

They found Fiset dead outside the truck and Thibault dead in the driver's seat. The coroner stated the cause of death was carbon monoxide poisoning, likely due to the truck's tailpipe being blocked with snow.

These two men did not have to die. They had at least three chances before the truck became stuck to avoid the resulting accident. If they had done any of the following the outcome would have been different.

1. Listened to the advice of their co-workers.
2. Heeded the emergency warnings.
3. Decided to obey the road closure barricades.

Be A Better Supervisor - Are Your Workers Ready for Working in the Cold?

To best way to prepare your workers for working in cold environments (indoor and outdoor) it's helpful for you to understand how cold conditions can affect them.

Four Factors of Cold Stress

- 1. Air temperature** - Of course as temperatures drop the air becomes cooler. A dip in temperatures, even a small drop, can put workers at risk for cold-related illnesses such as hypothermia. This is especially true when working in or being stranded in water waiting for rescue.
- 2. Wind speed** - When the wind is blowing you feel cooler, regardless of the temperature. Even on a hot day a breeze can help cool you. When it's cold and the wind blows the air will feel even colder on your skin. This is known as the wind chill or wind chill index - the combined effect of cold air and wind speed.
- 3. Humidity** - Humidity is a measure of moisture in the air. Water conducts heat away from your body 25 times faster than dry air, so the higher the humidity the quicker you will cool off. This is why you can die from hypothermia if you're in the water even when water temperature and air temperatures are relatively warm.
- 4. Contact with Cold Surfaces** - Being in contact with cold or wet surfaces and floors is the final risk factor.

You must carefully monitor all four conditions to keep workers safe in the cold. Here's why.

The Risks There are four forms of cold stress-related conditions.

Condition	Description	Potential Results
Frostbite	Freezing of the extremities due to loss of blood flow	Tissue damage, amputation
Trench foot (aka immersion foot)	Injury to the feet caused by prolonged exposure of the feet to wet and cold which causes blood flow to shut down	Tissue damage, amputation
Chilblains	Exposure to cold damages blood vessels and causes ulcers or blistering of the skin	Tissue damage
Hypothermia	Body temperature drops so low that the body loses heat faster than it can replace it. Result: The body uses up all its stored energy and can no longer produce heat	Shutdown of bodily functions and systems which can cause death

Be a Better Supervisor

Understand and Explain the Danger Our bodies must maintain a fairly constant internal temperature to function properly. If the body temperature falls too low, the blood vessels constrict, or tighten up, and it becomes harder to circulate blood throughout the body. After a while, the body shifts

blood flow away from the extremities and to the core. This can result in a series of dangerous and potentially fatal conditions known as cold stress.

Know Who Is at Risk

- Older workers—about 50% of all cold stress victims are 65 or older. Medical conditions and some medications can also put people at a higher risk for cold stress.
- Workers who work outdoors, including in agriculture, construction, oil and gas extraction and utilities.
- Workers who work in cold indoor environments, including refrigerated facilities in warehouse food plants and warehouses.
- Workers who work near or above water, i.e. fishermen.
- Divers and others who work in water.

Protect Employees The key to preventing cold stress is to implement measures that ensure workers aren't exposed to conditions that cause their core body temperature to drop below 95° F /35° C. Explain to workers what protections are available and how and when they are to be used.

1. Schedule cold work for the warmest part of the day.
2. Use radiant heaters, barriers to block the wind, and set up warm-up areas where workers can go to warm up.
3. Monitor the temperature, wind, and humidity and ensure workers are taking enough warm-up breaks. Use the *Work/Warm-Up Schedule* as a reference.
4. Explain and enforce the use of proper cold weather clothing. Warm and dry clothing is crucial to preventing cold stress and list the items workers should wear when performing work in cold conditions, which may include:
 - a. At least 3 layers of loose-fitting clothing, including:
 - i. An inner layer of wool, silk or synthetic materials to insulate the body against moisture.
 - ii. A middle layer of wool or synthetics for insulation in case the outer layer gets wet.
 - iii. An outer layer to protect against wind and moisture and that's ventilated to prevent overheating.
 - b. A hat or hood.
 - c. A knit mask to cover the worker's face and mouth.
 - d. Insulated and water-proof gloves and boots or other footwear.
5. Know and train workers on the signs, symptoms, and first aid treatment for cold-related illnesses. Refer to the downloadable *Signs, Symptoms, and First Aid Treatment for Cold-Related Conditions Table* at SafeSupervisor.com.

7-Step Cold Stress Workplan

Working in cold temperatures, whether indoors or outdoors, presents a unique set of hazards. Help your supervisors and workers avoid injury, amputation, and death from exposure by implementing a Cold Stress Workplan.

Step 1: Conduct Cold Stress Assessment

To identify cold stress hazards, you need to understand the human body functions normally when it has a “core” temperature of 98.6° F/38° C. If the core temperature drops too low, it can lead to problems such as:

- **Hypothermia** - the body loses heat and body temperature drops to 95°F /35°C or lower.
- **Frostbite** - freezing of the skin which can lead to amputation.
- **Trench foot** - freezing of the foot caused by immersion in cold water or prolonged exposure to extremely cold air.

Step 2: Measure Cold Stress Exposure

Seven Cold Stress Risk Factors

- 1. Temperature:** Consider not just ambient temperature as shown by the thermometer but how the air feels to the worker. Degree of exposure to cold stress is based on the concept of thermal comfort - how the air feels to the worker. The thermal comfort impacts the core body temperature.
- 2. Wet and Damp Conditions:** Wetness chills the body and increases the risk of cold stress.
- 3. Wind and Wind Chill:** The faster the wind, the colder a worker will feel. The combined effect of cold air and wind speed is called wind chill, or the temperature the body actually feels.
- 4. Contact with Cold Surfaces or Water:** Being in contact with something cold chills the body and increases risk of cold stress.
- 5. Workers' Physical Condition:** Age, weight, fitness and acclimatization.
- 6. Movement and Exertion:** Moving around and doing intense work warms the body. Standing around allows the thermal conditions to drop body temperature.
- 7. Clothing:** Clothing can insulate the body, helping it maintain body temperature and ward off cold stress.

Step 3: Keep Exposure to Cold at Safe Levels

To keep workers safe throughout the day you must continue to monitor temperature and wind chill levels to ensure thermal conditions are within safe levels.

Many Canadian territories and the U.S. (OSHA), use Threshold Limit Values (TLVs), a measurement used to define the maximum exposure limits for cold stress.

The American Conference of Governmental Industrial Hygienists (ACGIH) has created a *Work/Warm-Up Schedule* that you can reference.

Step 4: Implement Engineering Controls

Adopt engineering controls that eliminate or reduce the hazard. In the context of cold stress, these controls involve using methods to change the environment to ensure exposure is kept at safe TLVs including heating systems to warm the air, space heaters to warm sections of the workplace or heated trailers or other warming stations where workers can take breaks to warm up.

Step 5: Implement Safe Work Practices and Work Controls

Safe work practices and work controls include:

- Gradually getting workers used to working in the cold.
- Scheduling cold outdoor work for the warmest hours of the day.
- Giving workers lots of breaks so they can drink warm sweet drinks and soups.
- Training workers how to recognize and respond to different kinds of cold stress.
- Having appropriate first aid personnel, facilities and equipment.

Step 6: Require PPE Use

When there is still a hazard exposure, you must provide and require workers to wear PPE. Ideally, PPE will be used in combination with the other controls. For cold stress, this would include dressing in layers and wearing:

- Gloves.
- Insulation under the outer layers of clothes.
- Hats or hard hats to cover the head and ears.
- Waterproof outer layers when working in wet conditions.
- Warm socks and warm shoes.

Step 7: Provide Training

A proper cold stress training program must include:

- Knowledge of cold stress hazards.
- Recognition of predisposing factors, danger signs and symptoms.
- Awareness of first-aid procedures for, and the potential health effects of, different forms of cold stress.
- Workers' responsibilities in avoiding cold stress.
- Dangers of using drugs, including therapeutic ones, and alcohol in cold work environments.
- Use of protective clothing and equipment.
- Purpose and coverage of environmental and medical surveillance programs.

SUPERVISOR KIT *COLD STRESS*

Work/Warm-Up Schedule for Cold Weather Work

Here's a tool to help keep workers safe and warm when working in cold conditions. Use it to help you schedule work, maximum recommended work periods, and the number of warm-up breaks.

Work/Warm-up Schedule for a 4-Hour Shift

Air Temperature--Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approximate)	°F (approximate)	Maximum Work Period	Number of Breaks								
-26 to -28	-15 to -19	(Normal Breaks) 1		(Normal Breaks) 1		75 min	2	55 min	3	40 min	4
-29 to -31	-20 to -24	(Normal Breaks) 1		75 min	2	55 min	3	40 min	4	30 min	5
-32 to -34	-25 to -29	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
-35 to -37	-30 to -34	55 min	3	40 min	4	30 min	5	Non-emergency work should cease			
-38 to -39	-35 to -39	40 min	4	30 min	5	Non-emergency work should cease					
-40 to -42	-40 to -44	30 min	5	Non-emergency work should cease							
-43 & below	-45 & below	Non-emergency work should cease									

Schedule applies to any 4-hour work period with moderate to heavy work activity; with warm-up periods of ten (10) minutes in a warm location and with an extended break (e.g. lunch) at the end of the 4-hour work period in a warm location.

Adapted from ACGIH 2012 TLVs

By the Numbers

Rid These 7 Surfaces of Ice

Don't take chances when it comes to icy surfaces. Ice on walking and working surfaces can cause serious slip, trip, and fall hazards which can lead to disabling injuries, serious concussions, and loss of life.

Ice hanging from door and roof overhangs and any other overhead structures creates a falling object hazard. Massive sheets of ice can break free and slide down a roof. Large icicles can break and fall under their own weight or as the ice starts to melt. Smaller falling icicles can damage vision and cause other hazards and injuries.

Avoid these hazards by ensuring procedures are in place and enforced for the safe removal of ice on these seven surfaces. You can add surfaces specific to your area and the type of work being done.

